



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,904	08/11/2006	Wayne M. Moreau	FIS920030012US1	7740
32074	7590	08/20/2009	EXAMINER	
INTERNATIONAL BUSINESS MACHINES CORPORATION			LEE, SIN J	
DEPT. 18G			ART UNIT	PAPER NUMBER
BLDG. 321-482			1795	
2070 ROUTE 52				
HOPEWELL JUNCTION, NY 12533				
NOTIFICATION DATE		DELIVERY MODE		
08/20/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

EFIPLAW@US.IBM.COM

Office Action Summary	Application No.	Applicant(s)	
	10/597,904	MOREAU ET AL.	
	Examiner	Art Unit	
	Sin J. Lee	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 22 April 2009.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 8 and 10-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 8 and 10-13 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

- Certified copies of the priority documents have been received.
- Certified copies of the priority documents have been received in Application No. _____.
- Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/29/09, 7/27/09.

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) Notice of Informal Patent Application

6) Other: _____.

DETAILED ACTION

1. Claims 1-7, 9 and 14-19 are canceled claims.
2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

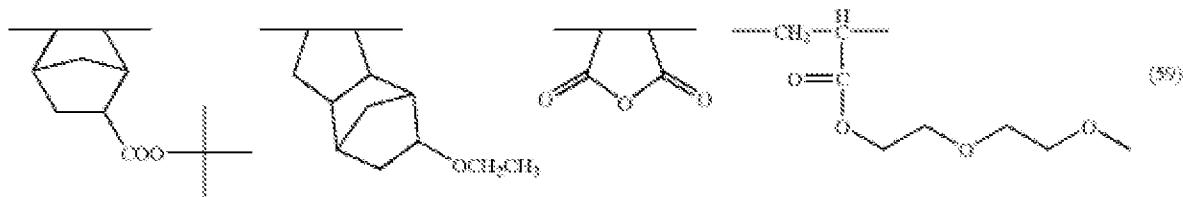
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 8, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori (US 2003/0186161 A1) in view of in view of Koguchi et al (4,814,244).

In Example 59, Fujimori teaches (see TABLE 7, [0332]-[0340] and TABLE 4)a positive photoresist composition containing Resin (59) shown below, an acid generator, a solvent, and basic compounds 2, 6 and 7, which are *triphenylimidazole* (present room

temperature solid base), 1,8-diazabicyclo[5.4.0]undec-5-ene (present liquid low vapor pressure base) and 1,5-diazabicyclo[4.3.0]non-5-ene, respectively:



Fujimori applies his positive photoresist composition onto a substrate. The resulting photoresist layer is exposed to light (such as KrF excimer laser beam, ArF excimer laser beam, or *electron beam*) through a desired mask, followed by baking and development to obtain a *resist pattern*. (see [0306]-[0307]). Fujimori also uses a reflection preventing film between the substrate and the photoresist layer (see [0356]). Fujimori's composition provides a resist pattern, in which edge roughness is improved and development defect is restrained (see [0009]).

Fujimori does not explicitly teach present etching step after the development or present material layer comprising a chromium-containing composition. As evidenced by Koguchi (col.1, lines 11-20), a resist pattern (such as Fujimori's resist pattern) is *widely used* in the field of semiconductor device, for example, in producing a mask for manufacturing the semiconductor device. As generally stated in Koguchi, such mask is manufactured by (i) depositing a metal layer such as a chromium layer on a surface of a glass substrate, (ii) coating a resist film on the metal layer, (iii) imagewise exposing the resist film by an electron beam, (iv) developing the resist film to form the resist pattern, and (v) selectively etching the metal layer by using the resist pattern as an etching

mask. Since Fujimori state that his positive photoresist composition is also used in the production process of semiconductor devices, and since Fujimori's composition is also usable with electron beam, it would have been obvious to one skilled in the art to use Fujimori's photoresist composition in the method of producing a mask for manufacturing the semiconductor device as illustrated by Koguchi with a reasonable expectation of obtaining a resist pattern having improved edge roughness and restrained development defect. Thus, Fujimori in view of Koguchi render obvious present inventions of claims 8, 12 and 13.

With respect to present claim 10, Fujimori's Resin (59) shown above contains an acid-decomposable group of t-butyl group. Fujimori also teaches other groups that can be used equally for his resin, such as tetrahydropyranyl group or a tetrahydrofuryl group (see [0143]-[0144]). Thus, it would have been obvious to one skilled in the art to replace the acid-decomposable group in Resin (59) with a tetrahydropyranyl group or a tetrahydrofuryl group with a reasonable expectation of success. Thus, Fujimori in view of Koguchi renders obvious present invention of claim 10.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimori (US 2003/0186161 A1) in view of Koguchi et al (4,814,244) as applied to claim 8 above, and further in view of Okumura et al (4,954,218).

Fujimori in view of Koguchi is discussed above. Even though Fujimori in view of Koguchi does not explicitly mention reactive ion etching for its etching step, it is conventionally known in the art, as evidenced by Okumura, col.1, lines 10-13, that for etching step in the art of semiconductor device, a reactive ion etching is utilized. Thus,

it would have been obvious to one skilled in the art to use a conventionally known etching technique such as reactive ion etching for the etching step in Fujimori in view of Koguchi. Thus, Fujimori in view of Koguchi and further in view of Okumura renders obvious present invention of claim 11.

Response to Arguments

6. Applicants argue that Fujimori discloses a photoresist composition where a wide range of base additives may be employed. Applicants argue that Fujimori does not teach performance of photoresists in the context of electron beam imaging to form patterned chrome layers and that the reference does not teach any specific combinations of base additives for such a process. However, in one of his specific working examples (Example 59), Fujimori already teaches a composition containing presently claimed combination of bases. Fujimori furthermore teaches that his composition can be used in electron beam radiation process. Even though Fujimori does not state that his composition is used in forming patterned chrome layers, Fujimori *in view of Koguchi, as discussed above in Paragraph 4*, renders obvious such process.

Applicants argue that Koguchi is cited to show the use of resist composition in ion beam patterning process and that the reference does not teach any specific combinations of base additives in the context of electron beam imaging to form patterned chrome layers. Applicants also argue that Koguchi does not teach electron beam imaging processes. First of all, Koguchi was *cited by the Examiner generally to show that a resist pattern is widely used in the field of semiconductor device, for example, in producing a mask for manufacturing the semiconductor devices and that*

such production method generally includes the steps of (i) depositing a metal layer such as a chromium layer on a surface of a glass substrate, (ii) coating a resist film on the metal layer, (iii) imagewise exposing the resist film by an *electron beam*, (iv) developing the resist film to form the resist pattern, and (v) selectively etching the metal layer by using the resist pattern as an etching mask. Besides, Koguchi does employ an electron beam imaging step (before the ion beam process) in obtaining his predicted deviation distribution data (see claims 1-4). As explained above in Paragraph 4, Fujimori in view of Koguchi (i.e., instead of Fujimori alone or Koguchi alone) renders obvious present electron beam imaging process to form patterned chrome layers.

Applicants argue that Okumura does not teach the use of combination of base additives, nor electron beam imaging to form patterned chrome layers. The Examiner never asserted that. Okumura was merely being cited by the Examiner to show that a reactive ion etching step is a conventionally known etching technique.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/
Primary Examiner, Art Unit 1795
August 16, 2009